Final Report
Phase I Environmental Site Assessment
and
Phase II Environmental Site Investigation

EaglePicher Pharmaceutical Services, LLC

Lenexa, Kansas

Prepared for

EaglePicher Incorporated

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EXECUTIVE SUMMARY

ENVIRON was requested by EaglePicher Incorporated (EPI) to undertake a Phase I environmental site assessment (ESA), and subsequently a Phase II environmental site investigation (ESI), of a site owned and operated by their subsidiary, EaglePitcher Pharmaceutical Services LLC (EPPS), in Lenexa, Kansasi. This work is being performed in support of the potential divestiture of this business, and in accordance with ENVIRON Proposal No. 04-028, dated April 6, 2004.

The site is located in an industrial area of Lenexa, Kansas, which is approximately ten miles southwest of downtown Kansas City, Kansas. It is comprised of approximately 5 acres with one manufacturing building (approximately 25,000 sq.ft.), an office trailer and two storage buildings (solvent and waste storage) are also located on the property. The EPPS facility is a research and production laboratory, specializing in the production of a wide range of high purity specialty chemicals for drug development.

The Phase I ESA site visit was performed on April 27, 2004, and the subsequent Phase II ESI field work was conducted May 5-6, 2004. The conclusions from both the Phase I and the Phase II are summarized below.

Phase I ESA Conclusions

Soil and Groundwater Impacts

Potential soil or groundwater impacts may have resulted from current or historic management of various chemicals, including chlorinated solvents and radioactive compounds. Potential areas of concern include the two storage buildings, as well as incidental storage and use of chemicals inside the main building.

There were no indications of spills other than incidental minor releases of chemicals in the hazardous waste and chemical storage areas, maintenance area, and throughout the production and work areas. Neither has ENVIRON been made aware of any major leaks or spills associated with the handling of oil and chemicals. However, due to nature of the operation and use of chemicals at the site, a Phase II ESI was recommended.

Compliance and Infrastructure Issues

Some minor issues of concern have been identified with respect to compliance and infrastructure at the facility:

- *Asbestos is present at least in the transite lining of the majority of the forty-one fume hoods operated at the site. Employees are informed about the asbestos content of this material and instructed not to disturb the material in any way. It is recommended that this material be labelled. Further, given the age of the facility, the presence of other asbestos-containing*

material cannot be excluded. ENVIRON recommends that a formal asbestos survey be performed prior to any renovation or demolition of the facility.

- *The plant was issued a violation notice by the Kansas Department of Health & Environment (KDHE) on March 3, 2004. The alleged violations included failure to provide adequate employee training and improper labelling of hazardous waste. The calculated penalty proposed to the site is $5,100. The plant intends on entering into a consent agreement to conduct Supplemental Environmental Projects (SEP) pursuant to KDHE guidelines in lieu of paying the fine. The SEPs may include activities such as making improvements to chemical storage areas, providing supplemental employee training, or improving overall environmental management at the plant.*

- *The facility maintains an industrial wastewater discharge permit (No. 981MB112) with Johnson County. The facility was listed as having "infrequent non-compliance" for the second half of 2003 due to the detection of methylene chloride (MeCl) at 0.334 mg/l in the plant's sewer effluent, somewhat above the discharge limitation of 0.036 mg/l for that parameter. No violations were issued because of this excursion and the plant has improved employee training and lab management practices to avoid future violations.*

- *EPPS has prepared a Closure Plan in accordance with Title 40 of the Code of Federal Regulations, Part 265, Subpart G, which specifies the closure requirements that apply to all interim status hazardous waste management facilities. Based on the latest version of the Closure Plan, the total estimated cost for closure is $1,480,530. A letter of credit is in place to cover this cost as well as an additional $750,000, which is an amount necessary to meet the closure cost financial assurance requirements of the Nuclear Regulatory Commission.*

Phase II ESI Conclusions

Groundwater monitoring wells were installed at the bedrock surface encountered at approximately 15 feet below ground surface. Although soil moisture was encountered at this depth, groundwater was not present in the wells. The assumed groundwater flow direction, based upon local topography (and assuming groundwater were present), is southeast.

A total of seven shallow soil samples were collected from the three monitoring wells and four shallow soil borings and analyzed for volatile organic compounds (VOCs) and total RCRA metals.

- *Acetone was detected in three of the shallow soil samples (collected at LMW-1, LMW-2 and LSB-1) at concentrations significantly below the Risk Based Standards for Kansas (RBSK) provided by the Kansas Department of Health and Environment (KDHE) (risk-based non-residential scenario cleanup objectives).*

- *2-Butanone (methyl ethyl ketone, MEK) was detected in LMW-2 at a concentration significantly below the soil to groundwater protection pathway concentration of the RBSK.*

- *All reported RCRA metal concentrations in the soil samples collected were unremarkable compared to the risk-based non-residential scenario cleanup objectives, with the exception of arsenic. Arsenic was detected in four shallow (0.5-2.0 ft bgs) samples at a concentration marginally above the non-residential RBSK criteria for the "soil-to-groundwater pathway" (9.3, 7.9, 6.9 and 6.3 mg/kg vs. 5.8 mg/kg at LMW-1, LMW-2, LSB-1 and LSB-3, respectively). Since no groundwater was found to be present, these marginal excedances are not of concern.*

ENVIRON recommended that the absence of groundwater at the site be confirmed or, if groundwater is found to be present, water level measurements and groundwater samples should be collected. This recommendation was accepted and was implemented on May 26, 2004. The results from that fieldwork indicated the following:

- *Groundwater was found in only one of three wells on-site (LMW-2) after approximately three weeks;*

- *Arsenic was not detected above the method detection limit; and,*

- *Cadmium was detected just above the method detection limit, which in this case is equal to the RBSK groundwater threshold. As noted above, however, the concentration of cadmium in the soil sample from this location was significantly below RBSK threshold criteria.*

Based on these results, and the fact that cadmium is not known to have been used at the facility, it is concluded that neither arsenic nor cadmium are constituents of concern at this location and subsequently that this site does not present an unacceptable risk to health or the environment. ENVIRON further recommends that the wells be properly abandoned.

1.0 INTRODUCTION

1.1 BACKGROUND

ENVIRON International Corporation (ENVIRON) was requested by EaglePicher Incorporated (EPI) to undertake a Phase I environmental site assessment (ESA) and a Phase II environmental site investigation (ESI) of a site owned and occupied their subsidiary, EaglePicher Pharmaceutical Services, LLC (EPPS), located in Lenexa, Kansas. EPPS is a research and development facility that specializes in the production of high purity chemicals for drug development. These include bulk drug substances, synthesis intermediates, carbon-14 and tritium, and custom synthesis products using stable radioactive isotopes. This work was performed in support of the potential divestiture of the business, and in accordance with ENVIRON Proposal No. 04-028, dated April 6, 2004.

The ESA was undertaken by Michael Woodbury of ENVIRON on April 27, 2004. Interviews and discussions were held by Michael Woodbury with Mr. Clinton Greg (Safety and Environmental Compliance Officer). The Phase II investigation was subsequently undertaken between May 5 and 6, 2004, and consisted of installing three groundwater monitoring wells and four shallow soil borings.

The groundwater monitoring wells were installed at the bedrock surface encountered at approximately 12 feet below ground surface (bgs). Although soil moisture was encountered at this depth while drilling, no groundwater was present in the wells. ENVIRON recommended that the absence of groundwater at the site be confirmed or, if groundwater is found to be present, water level measurements and groundwater samples should be collected. This recommendation was accepted and was implemented on May 26, 2004.

This report is addressed to EaglePicher. In the event of the disclosure of the report (or any part thereof) to any other party, ENVIRON will accept no responsibility to any other person to whom it is disclosed, unless this has been agreed to in writing by EaglePicher and ENVIRON.

1.2 OBJECTIVES AND SCOPE OF WORK

The principal objective of the ESA and ESI were to identify and evaluate potential environmental liabilities resulting from former and current site operations. Specific objectives included:

- Assessment of the environmental context of the site and of adjacent areas including potential receptors and other environmentally sensitive issues and identify any potential influences of any neighboring sites on the facility itself;

- Identification of potential environmental impacts arising from known historic and current activities on site; and,

- To identify and evaluate potential liabilities relating to existing site activities with respect to soil and groundwater liabilities, air emissions, wastewater, material storage and handling, waste management and deleterious materials in the context of current and potential future environmental regulations.

To meet the project objectives, the following tasks were developed:

Task 1 – Desk-Based Study

A desk-based review was completed using publicly available information including:

- Published current and historical topographic and geological maps;

- Historical aerial photographs;

- Historical city directories; and

- An environmental database search.

Task 2 – Site Visit

A site visit and assessment of the facility was performed by Michael Woodbury of ENVIRON on April 27, 2004. The audit included interviews with personnel, a general review of operations carried out at the facility, and a review of environmental documentation. Observations were made on areas of stained concrete and other evidence of possible impacts to the property, and the nature of adjacent land uses was identified.

Task 3 – Site Investigation

Based on the results and conclusions from the Phase I ESA, a Phase II ESI was proposed and authorized. The fieldwork was undertaken on May 5 and 6, 2004, and consisted of installing three groundwater monitoring wells and four shallow soil borings. Since groundwater was not encountered in the wells on May 6, 2004, a second field effort was performed on May 26 and 27, 2004 to measure water levels and collect groundwater samples if groundwater was present. Groundwater was present in one of the three wells and sampling was performed on May 27, 2004.

Task 4 – Data Assessment and Reporting

This report presents the findings of the environmental site assessment and is based on publicly available information, company records, site inspection, and discussion with facility personnel.

Results of the environmental site investigation including sampling and testing of soils and waters has been included as part of this assessment.

2.0 SITE DESCRIPTION

2.1 SITE OWNERSHIP

The site is owned by EPPS. The property was first developed by EPI in 1984 and operated under the name ChemSyn Science Laboratories. In 2003 the name was changed to ChemSyn, later in 2003 it was changed to ChemSyn LLC, and in 2004 it was renamed EaglePicher Pharmaceutical Services LLC.

2.2 SITE SETTING

The site is located in an industrial park approximately ten miles southwest of Kansas City, Kansas. The topography of the site is relatively level, with surrounding land sloping gently from the northwest down to the southeast. The site is surrounded as follows:

- To the west beyond the vacant portion of the sites lies a manufacturing facility operated by The Pack America Corp.
- To the north lies West 96th Terrace bordering the property with a fire station located on the other side of the street.
- To the east lies Pflumm Road with residential property beyond.
- To the south is a warehouse complex occupied by a variety of business including Richo, Regal Distributing, and Keddeg Company.

2.3 SITE HISTORY

The site was developed by EPPS in 1984 on undeveloped farmland, based on historical aerial photographs from that time period and site information. Few changes, besides product variations, have been made to the site since it was opened in 1984. Minor alterations to plant layout have included changing access doors to various labs and modifying walls in the office area.

There is no history of major spills or fires at the site. All past spills were reportedly minor and contained within concreted containment areas or by the plant floor.

2.4 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

2.4.2 Geology

Based upon the results of the site investigation (see Section 4.0), silty clay soil is encountered at the site to the depth investigated (approximately 10 feet below ground surface). At depths greater than 10 feet, silty clay was encountered with weathered limestone, chert or fine sand to auger refusal, which was assumed to be bedrock, at depths ranging from 11 to 13.5 feet below ground surface. Rock coring was not performed.

2.4.3 Hydrogeology

Groundwater was not encountered during the site investigation (see Section 4.0). The assumed groundwater flow direction, if groundwater were present, is southeast based upon local topography.

2.5 DATABASE INFORMATION

Environmental Data Resources, Inc. was contracted to perform a review of environmental information available for the subject and surrounding properties. The subject property is listed on several databases indicative of its status as a RCRA large quantity generator and interim facility status. The facility also appears to have had past inspections under the Toxic Substance Control Act. Although a large number of RCRA violations are reported between the years 1992 and 2001, all issues have reportedly been settled with no further action. There are no indications of any violations since 2001 on the EDR report.

It does not appear that properties immediately adjacent or up gradient from the site present any significant risk to groundwater at the site. Moreover, based on ENVIRON's Phase II investigation, shallow groundwater above bedrock was not encountered thus further limiting the potential for subsurface transport of constituents.

3.0 PHASE I ENVIRONMENTAL SITE ASSESSMENT FINDINGS

3.1 SITE DESCRIPTION

The site covers an approximate surface area of 5.1 acres. One manufacturing building occupies the site, as shown in Figure 2. An office trailer and two storage buildings (solvent and waste storage) are also located on the property. The production building, which covers approximately 25,000 square feet, is located in the eastern portion of the site and comprises a single-story building with mezzanines used for office accommodation, laboratory and maintenance activities, and warehousing. A hazardous waste building and chemical storage building are located along the south side of the production building. Concrete surfaces inside and outside the building are in good condition.

A parking lot is located immediately east and south of the production building and is asphalt surfaced. The delivery of raw materials occurs from the southern part of the building within a single loading dock. There are areas of ground that are not surfaced (gravel or grass) located around the hazardous waste and chemical storage buildings.

The main site utilities include gas for heating, electricity, and water supply. Drainage comprises separate surface water and sewer drainage system.

3.2 SITE OPERATIONS

The EPPS facility is a research and development laboratory, specializing in the production of a wide range of high purity specialty chemicals for drug development. These include bulk drug substances, pharmaceutical intermediates, Carbon-14 and Tritium radio-labelled products and synthesis intermediates, and custom synthesis using stable radioactive isotopes.

The majority or activities at the site are limited to wet chemistry or commercial syntheses. All operations are conducted in laboratories, each equipped with multiple fume hoods (a total of 41 laboratory hoods are operated at the site). The synthesis and mixing of chemicals are typically conducted in ten-gallon glass reactors and smaller. The facility also operates a gas chromatograph, high-pressure liquid chromatograph, centrifuges and other laboratory equipment. Small refrigeration units are used in the labs for storing material and product.

Because of the nature of the operations as a research and development facility, a large variety of chemicals are used at the site. It is estimated that 16,000 different chemicals including halogenated and non-halogenated solvents, acids and bases, oils, and other materials have been stored and used by the operation since 1984. Currently, it is estimated that approximately 7,000 different chemicals are stored at the site. Chemicals currently used and stored in the largest

quantities by the laboratory operations include acetone and methylene chloride (MeCl); chemicals are not stored in containers larger than 55-gallons. Oils, lubricants, and coolants are also stored in drums at the site for facility maintenance activities.

3.3 DELETERIOUS MATERIALS

3.3.1 Asbestos

Site personnel reported that no formal surveys for asbestos had been conducted at the facility. The only ACM present at the site is believed to be the transite liner present in a number of the 41 laboratory fume hoods operated at the site. All observed potential ACM was in good condition and did not appear to present a significant hazard to employees if maintained undisturbed.

The presence of other ACM, however, cannot be discounted given the age of the facility.

3.3.2 Polychlorinated Biphenyls (PCBs)

No PCB-containing equipment is believed to be present at the site. The pad-mounted transformer present at the site is labelled as non-PCB containing.

3.3.3 Ozone-depleting Substances

There are multiple small air conditioning units located in the office area. According to site management, these units contain the Freon refrigerant R-12 (considered a CFC) and are regularly maintained by a licensed contractor. CFCs are also contained in the chiller unit maintained at the site. A licensed contractor also maintains this equipment.

3.4 STORAGE AND USE OF HAZARDOUS MATERIALS

3.4.1 Underground Tanks

There are no underground storage tanks (UST) currently in use at the site, and plant personnel had no knowledge of former USTs ever being located at the property. ENVIRON did not observe any evidence of UST systems (e.g. fill pipes, vent lines, leak detection systems or manways) during the site inspection.

3.4.2 Above Ground Storage Tanks (ASTs)

No aboveground storage tanks exist at the site. All chemicals are maintained in 55-gallon drums or smaller containers.

3.4.3 Drum and Other Storage

Drums and smaller containers of chemicals, including halogenated and non-halogenated solvents, corrosives, low-level radioactive materials (Carbon-14 and Tritium) and oils are stored throughout the laboratories and storerooms. There is no outside storage of any chemicals.

Containers were stored in flammable storage cabinets, shelves, or in the case of larger containers along the side of the laboratories or storerooms. At the time of the inspection chemicals stored in 55-gallon containers included two drums of acetone and three drums of MeCl. Generally, materials were not stored within secondary containment if stored within the production building. Concrete secondary containment dikes were provided in both the hazardous waste and chemical storage buildings. Overall, the drum storage at the facility was well maintained.

Minor chemical staining was noted on laboratory floors, in the maintenance area, and within the hazardous waste and chemical storage buildings. None of the staining observed by ENVIRON was indicative of a major release.

3.5 WASTE MANAGEMENT

The facility generates a number of regulated wastes, including hazardous wastes and low-level radioactive wastes mixed with solvents. Chemical wastes generated at the facility include small-scale non-radioactive solvent waste, large-scale custom synthesis non-radioactive solvent waste, low-level radioactive solvent waste (mixed waste), scintillation vials, and expired commercially produced halogenated and non-halogenated chemical waste. A summary of off-site waste management facilities is provided as Appendix E.

Most of the waste generated by EPPS consists of spent halogenated and non-halogenated solvents that are disposed as hazardous waste. The facility is a large quantity generator for hazardous waste and maintains the EPA Generator ID Number KSD980966501. RCRA waste codes typically assigned to the mixed and non-mixed waste generated at the site typically include D001, D002, D005, D007, D021, D022, D036, F002, F003, and F005. The facility also generates hazardous and special wastes from unused laboratory chemicals and sorbent materials. Used oils, batteries, coolants, and lighting materials are recycled off site.

EPPS also generates mixed waste streams consisting of spent halogenated and non-halogenated solvents that contain low levels of the radioactive isotopes Carbon-14 and Tritium. A small percentage of the mixed waste stream that contains very low levels of radioactivity is disposed of at a licensed disposal facility.

Radiolabeled chemicals are critical to the medical care industry and essential to EPPS operations. However, few alternatives are available for the waste disposal of these materials. For this reason,

in 1990 EPPS (then ChemSyn Science Laboratories) submitted a Part A application to the KDHE to store mixed waste at the facility for a period of time greater than 90 days. KDHE granted EPPS interim status to operate 13 mixed waste storage units, also considered solid waste management units (SWMUs). The SWMUs include points of generation located throughout the plant and are typically chemical storage cabinets or laboratory hoods. The hazardous waste storage building is also included in the list of SWMUs, as is the chemical storage building because of past storage practices in this area. EPPS is occasionally able to identify affordable disposal alternatives for these wastes. Currently, approximately six drums of mixed waste are stored at the site within the hazardous waste storage building.

The facility also stores less than six gallons of low-level radioactive waste containing dioxins. This material was generated in the mid 1990's from the production of environmental test kits used to test for dioxins in the field. This material is being stored in accordance with its Part A Permit until a feasible disposal method is identified.

EPPS has prepared a RCRA Closure Plan in accordance with the 40 CFR 265, Subpart G closure requirements for interim status hazardous waste management facilities. Based on the latest version of the Closure Plan, the total estimated cost for closure is $1,480,530. A letter of credit is in place to cover this cost, as well as an additional $750,000, which is necessary to meet the closure cost financial assurance requirements of the Nuclear Regulatory Commission. Both of these closure estimates include the anticipated cost to dispose of all mixed wastes stored at the site, as well as confirmation sampling for both solvent and radioactive residues.

Five drums of drums containing waste materials were located at areas designated for satellite storage. These were being managed in accordance with applicable regulations.

The plant was issued a violation notice by the Kansas Department of Health & Environment (KDHE) on March 3, 2004. The violations included failure to provide adequate employee training and improper labelling of hazardous waste. The calculated penalty proposed to the site is $5,100. The plant intends on entering into a consent agreement to conduct Supplemental Environmental Projects (SEP) pursuant to KDHE guidelines in lieu of paying the fine. The SEPs may include activities such as making improvements to chemical storage areas, providing supplemental employee training, or improving overall environmental management at the plant.

3.6 EMISSIONS TO ATMOSPHERE

Emissions arising at the site are vented directly to atmosphere and include emissions from the gas-fired furnace and air extracted via laboratory hoods. No air emission monitoring has been performed at the site. According to the facility personnel certain solvents (VOCs, VOCls) will be present in the laboratory ventilation hood emissions, although the nature of the activities are of a sufficiently small scale that they are unlikely to require specific air emission controls.

The KDHE issued a determination letter to the facility dated December 5, 1989 that confirmed no air permit would be required if total VOC emissions from the site remained below 20,000 pounds per year. Site personnel reported that actual emissions from the site are a fraction of that limit. No solvent odors were noted during the site inspection.

3.7 WATER MANAGEMENT

3.7.1 Water Use and Management

The Johnson County Water District No. 1 supplies water to the site for potable, sanitary and general laboratory cleaning purposes. There is no requirement for process water.

3.7.2 Wastewater Management

Because the facility operates numerous laboratory operations that have the potential to discharge contaminants to the sewer system, they are required to maintain an Industrial Wastewater Discharge Permit. The facility maintains permit No. 981MB112 that expires on February 23, 2008. The facility is required to perform semi-annual monitoring of its sewer discharge.

The facility was listed as being in "infrequent non-compliance" for the second half of 2003 due to the detection of MeCl at 0.334 mg/l in the plant's sewer effluent, somewhat above the discharge limitation of 0.036 mg/l for that parameter. No violations were issued because of this excursion and the plant has improved employee training and lab management practices to avoid future violations.

Precipitation run-off is thought to drain to a separate storm water system, but no site drainage plan was available. During the site visit, surface drains were observed in the parking lot area. The facility is not subject to storm water permitting in Kansas because there is no outdoor storage of chemicals at the site.

3.8 SOIL AND GROUNDWATER IMPACT ISSUES

3.8.1 On-site Potential Source Areas

Potential soil or groundwater impacts may have resulted from current or historic management of various chemicals, including chlorinated solvents and radioactive compounds. Potential areas of concern include the two storage buildings, as well as incidental storage and use of chemicals inside the main building. There is no outside storage of any chemicals.

There were no indications or spills other than incidental minor releases of chemicals in the hazardous waste and chemical storage areas, maintenance area, and throughout the laboratory and work areas. ENVIRON has not been made aware of any major leaks or spills associated with the handling of oil and chemicals. However, due to nature of the operation and use of chemicals at the site, a Phase II ESI was recommended.

3.8.2 Off-site Potential Source Areas

No off-site potential source areas were identified that could impact soil and groundwater at the site.

3.9 PHASE I CONCLUSIONS AND RECOMMENDATIONS

Various chemicals, including chlorinated solvents and radioactive compounds, have been used and stored at this facility. Although there were no indications of spills other than incidental minor releases of chemicals in the hazardous waste and chemical storage areas, maintenance area, and throughout the production and work areas, and ENVIRON has not been made aware of any major leaks or spills associated with the handling of oil and chemicals, potential soil or groundwater impacts from incidental and/or accidental releases cannot be excluded. Areas of specific concern would be the two storage buildings, as well as incidental storage and use of chemicals inside the building.

In addition, some issues of concern have been identified with respect to compliance and infrastructure at the facility, specifically:

- Asbestos is present at least in the transite lining of the majority of the forty-one fume hoods operated at the site. Employees are informed about the asbestos content of this material and instructed not to disturb the material in any way. It is recommended that this material be labelled. Further, given the age of the facility, the presence of other asbestos-containing material cannot be excluded. ENVIRON recommends that a formal asbestos survey be performed prior to any renovation or demolition of the facility.

- The plant was issued a violation notice by the Kansas Department of Health & Environment (KDHE) on March 3, 2004. The alleged violations included failure to provide adequate employee training and improper labelling of hazardous waste. The calculated penalty proposed to the site is $5,100. The plant intends on entering into a consent agreement to conduct Supplemental Environmental Projects (SEP) pursuant to KDHE guidelines in lieu of paying the fine. The SEPs may include activities such as making improvements to chemical storage areas, providing supplemental employee training, or improving overall environmental management at the plant.

- The facility maintains an industrial wastewater discharge permit (No. 981MB112) with Johnson County. The facility was listed as having "infrequent non-compliance" for the second half of 2003 due to the detection of methylene chloride (MeCl) at 0.334 mg/l in the plant's sewer effluent, somewhat above the discharge limitation of 0.036 mg/l for that parameter. No violations were issued because of this excursion and the plant has improved employee training and lab management practices to avoid future violations.

- EPPS has prepared a Closure Plan in accordance with Title 40 of the Code of Federal Regulations, Part 265, Subpart G, which specifies the closure requirements that apply to all interim status hazardous waste management facilities. Based on the latest version of the Closure Plan, the total estimated cost for closure is $1,480,530. A letter of credit is in place to cover this cost as well as an additional $750,000, which is an amount necessary to meet the closure cost financial assurance requirements of the Nuclear Regulatory Commission.

Based on these findings, ENVIRON recommended the following:

- A Phase II ESI should be performed to evaluate whether soil and groundwater has been impacted by EPPS. EPI approved this recommendation; and the procedures and results from the ESI are described in Section 4.0;

- As a good management practice, the facility should conduct a formal asbestos survey of the entire facility prior to any renovation or demolition of the facility.

4.0 SITE INVESTIGATION

4.1 SCOPE OF WORK

ENVIRON installed three monitoring wells and four shallow soil borings. The monitoring wells and borings were performed between May 5 and 6, 2004. Drilling activities were subcontracted to Max's Enterprises and were performed using a Mobile B-53 truck-mounted drill rig using hollow stem augers. Boring and well locations were surveyed by Anderson Survey Company after field activities were complete.

Groundwater was not present after the monitoring wells were completed May 6, 2004. To confirm that groundwater was not present, ENVIRON re-visited the site on May 26, 2004. Some water was present in LMW-2 on May 26 when water levels were measured. A sample of the water was subsequently collected from the well on May 27, 2004. Groundwater was not present in the other two monitoring wells (LMW-1 and LMW-3).

4.1.1 Soil Borings

The soil (unsaturated zone) investigation comprised the advancement of 4 shallow borings to a maximum depth of 5 feet below ground surface and 3 borings for the installation of monitoring wells to depths ranging from 11 to 13.5 feet below ground surface. Each boring was continuously sampled and screened using a photoionization detector (PID) to assess potential volatile organic compound (VOC) impact in the soil.

The boring and monitoring well locations selected were as follows:

- LMW-1 – Assumed down gradient location southeast of the building, hazardous and mixed waste storage building, and solvent storage building;
- LMW-2 – Assumed down gradient location southeast of the building;
- LMW-3 – Background monitoring well;
- LSB-1 – South of the hazardous and mixed waste storage building, and solvent storage building;
- LSB-2 – South of the shipping dock;
- LSB-3 – West of the hazardous and mixed waste storage building, and solvent storage building; and
- LSB-4 – North of the hazardous and mixed waste storage building, and solvent storage building.

Monitoring well and boring locations are shown on Figure 3.

4.1.2 Groundwater Monitoring Wells

Three groundwater monitoring wells (LMW-1 through LMW-3) were advanced to depths ranging from 11 to 13.5 feet below ground surface. The well locations are shown on Figure 3, and are as follows:

- LMW-1 – Assumed down gradient location southeast of the building, hazardous and mixed waste storage building, and solvent storage building;
- LMW-2 – Assumed down gradient location southeast of the building; and
- LMW-3 – Background monitoring well.

The monitoring wells were constructed with two-inch diameter PVC casing and well screen. Each well was constructed with five feet of No. 10 slot well screen. The wells were constructed with sand placed in the annular space between the exterior of the well screen and the boring to approximately two feet above the well screen. The remaining annular space was filled with hydrated bentonite chips to within 0.5 feet of the surface. Each well was completed with a flush-mounted protective cover set in concrete placed at the surface.

The borehole logs and well construction details are presented in Appendices A and B.

4.2 FIELD OBSERVATIONS

4.2.1 Soil

Silty clay soil is encountered at the site to depths investigated of approximately 10 feet below ground surface. At depths greater than 10 feet, silty clay is encountered with weather limestone, chert or fine sand to auger refusal assumed to be bedrock at depths ranging from 11 to 13.5 feet below ground surface. Rock coring was not performed.

4.2.2 Groundwater

Moisture was encountered in soil at the bedrock surface at depths ranging from 11 to 13.5 feet below ground surface while drilling at all three locations. However, groundwater was not encountered after the monitoring wells were constructed on May 6, 2004. The assumed groundwater flow direction, if groundwater were present, is southeast based upon local topography. Table 1 provides the elevations for the monitoring wells for reference.

ENVIRON subsequently recommended that the absence of groundwater at the site be confirmed. Water level measurements were then performed on May 26, 2004. Water was present in LMW-2, but wells LMW-1 and LMW-3 remained dry. The depth to water in LMW-2 was approximately 9.5 feet bgs. Table 1 provides the water level measurement.

4.3 SAMPLING STRATEGY

4.3.1 Soil Sampling

Soil samples collected for laboratory analysis were collected near the surface since no VOCs were detected while screening soil samples. Soils samples were obtained directly from the drilling tools using clean disposable sampling equipment.

A total of 7 soil samples were collected for laboratory analysis consisting of VOCs and total RCRA metals from the three monitoring wells and four shallow soil borings. The soil samples were submitted to Environmental Science Corporation for analysis with the relevant chain of custody documentation.

4.3.2 Groundwater Sampling

Groundwater was not encountered in the monitoring wells, and therefore was not sampled on May 6, 2004.

Groundwater was encountered in monitoring well LMW-2, but wells LMW-1 and LMW-3 were dry. A groundwater sample was collected from LMW-2 on May 27, 2004.

4.4 SOIL RESULTS

4.4.1 Criteria for Interpretation

The soil samples were analyzed for VOCs and total RCRA metals, and the soil results are summarized on Table 2.

Soil sample laboratory results were compared with the latest published cleanup objectives provided in the Risk Based Standards for Kansas (March 1, 2003). ENVIRON selected the Tier 2 risk-based non-residential scenario cleanup objectives for the soil pathway, and soil-to-groundwater protection pathway. The lower of the guidelines for each constituent of concern was selected as the threshold objective for the discussion presented below. The concentrations for the

soil pathway and soil to groundwater protection pathway for each constituent are included on Table 2.

4.4.2 VOCS

Acetone was detected in LMW-1, LMW-2 and LSB-1 at concentrations of 0.076, 0.12 and 0.036 mg/kg, respectively. These concentrations are significantly below the soil to groundwater protection pathway concentration of 3.8 mg/kg.

2-Butanone (MEK) was detected in LMW-2 at a concentration of 0.017 mg/kg. This concentration is significantly below the soil to groundwater protection pathway concentration of 12 mg/kg.

4.4.3 RCRA Metals:

All reported RCRA metal concentrations in the soil samples collected were unremarkable compared to the risk-based non-residential scenario cleanup objectives. Arsenic was detected in four shallow (0.5-2.0 ft bgs) soil samples at a concentration marginally above the non-residential RBSK criteria for the "soil-to-groundwater pathway" (9.3, 7.9, 6.9 and 6.3 mg/kg vs. 5.8 mg/kg at LMW-1, LMW-2, LSB-1 and LSB-3, respectively). Since no groundwater was found to be present LMW-1 or the shallow borings, these marginal excedances are not of concern. Arsenic was not detected in the groundwater sample collected from LMW-2.

4.5 GROUNDWATER RESULTS

4.5.1 Criteria for Interpretation

The groundwater sample was analyzed for VOCs and total RCRA metals, and the results are summarized on Table 3.

Groundwater sample laboratory results were compared with the latest published cleanup objectives provided in the Risk Based Standards for Kansas (March 1, 2003). ENVIRON selected the Tier 2 risk-based non-residential scenario cleanup objective for the groundwater pathway as the threshold objective for the discussion presented below (also on Table 3

4.5.2 VOCS

No VOCs were detected above reporting limits in the groundwater sample collected from LMW-2.

4.5.3 RCRA Metals:

Only barium and cadmium were detected in the groundwater sample from LMW-2 at concentrations of 0.23 mg/l and 0.0055 mg/l, respectively. Barium was detected well below the RBSK groundwater concentration of 2 mg/l. Cadmium was detected just above the method detection limit, which in this case is equal to the RBSK groundwater threshold. As noted above, however, the concentration of cadmium in the soil sample from this location was significantly below RBSK threshold criteria.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of a Phase I ESA, ENVIRON determined that due to the current and historic usage of various chemicals, including chlorinated solvents and radioactive compounds, the potential for soil or groundwater impacts at the EPPS site in Lenexa could not be excluded. A Phase II ESI was subsequently recommended and implemented.

A Phase II ESI focused on soil (7 locations) and groundwater (3 wells) in the vicinity of current and historic chemical storage areas detected trace concentrations of acetone and MEK in soil significantly below the respective Risk-Based Standards for Kansas. All reported RCRA metal concentrations in the soil samples collected were unremarkable compared to the risk-based non-residential scenario cleanup objectives, with the exception of arsenic. Arsenic was detected in four shallow (0.5-2.0 ft bgs) samples at a concentration marginally above the non-residential RBSK criteria for the "soil-to-groundwater pathway" (9.3, 7.9, 6.9 and 6.3 mg/kg vs. 5.8 mg/kg at LMW-1, LMW-2, LSB-1 and LSB-3, respectively). No groundwater was observed in the wells when sampling was attempted on May 6, 2004. Since no groundwater was found to be present, these marginal excedances are not of concern.

ENVIRON recommended that the absence of groundwater at the site be confirmed or, if groundwater is found to be present, water level measurements and groundwater samples should be collected. This recommendation was accepted and was implemented on May 26, 2004. The results from that fieldwork indicated the following:

- Groundwater was found in only one of three wells on-site (LMW-2) after approximately three weeks;
- Arsenic was not detected above the method detection limit in groundwater from LMW-2; and,
- Cadmium was detected just above the method detection limit, which in this case is equal to the RBSK groundwater threshold. As noted above, however, the concentration of cadmium in the soil sample from this location was significantly below RBSK threshold criteria.

Based on these results, and the fact that cadmium is not known to have been used at the facility, it is concluded that neither arsenic nor cadmium are constituents of concern at this location and subsequently that this site does not present an unacceptable risk to health or the environment. ENVIRON does recommend that the wells be properly abandoned.

APPENDIX A: BORING LOGS

APPENDIX B: WELL CONSTRUCTION DIAGRAMS

APPENDIX C: LABORATORY REPORTS

APPENDIX D: EDR DATABASE REPORT

APPENDIX E: OFF-SITE WASTE MANAGEMENT FACILITIES SUMMARY